

Interactive comment on “The PMIP4 contribution to CMIP6 – Part 3: the Last Millennium, Scientific Objective and Experimental Design for the PMIP4 past1000 simulations” by Johann H. Jungclaus et al.

Anonymous Referee #1

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Review Jungclaus et al. 'The PMIP4 contribution to CMIP6 - Part 3: the Last Millennium, Scientific Objective and Experimental Design for the PMIP4 past1000 simulations'

This paper provides a useful overview of the objective and setup of the planned PMIP4 simulations covering the preindustrial millennium. It is generally well written and clear, and I have only a few minor suggestions for improvement. This paper will serve the community well and I would recommend accepting it for publication in GMD.

Main comments

C1

Introduction. In my view, the introduction could be improved by stating more clearly the objective of this paper and the added value compared to PMIP3-CMIP5. The main improvements relative to PMIP3 are summarized in Section 6 (Conclusions), but after reading the last two paragraphs of the introduction, it was not clear to me what the exact innovation is in the PMIP4 past1000 simulations compared to PMIP3. So I suggest to revise the main paragraph on page 4 (starting at line 5) to clarify this point.

Scope of the paper. The title and the introduction suggest that this paper is about the tier-1 past1000 experiments, but in fact also the forcings for the historical simulations are discussed. Is there a separate paper planned to explain the setup of the historical simulations in detail? If not, I would suggest to slightly modify the title to broaden the scope.

Section 3.3. I find the explanation of the tier-2 experiments rather vague. For instance, what is the time period to be covered in these simulations? Is it also the full 1000-year period of 850-1849 CE? Will the same initial conditions be used as in the tier-1 experiments? If the models are run in ensemble mode, what is the recommended number of ensemble members? I suggest making this section more specific.

Minor comments

Page 1, line 10. 'This is particularly acute for regional and sub-continental scales'. I suggest specifying what regions are of special interest here.

Page 1, line 15. 'preindustrial millennium'. Please explain here that you mean the 850-1849 CE period.

Page 6, line 11. 'a updated forcing datasets'. Remove 'a'.

Page 6, Section 3. Please briefly explain already here what the difference is between tier-2 and tier-3 experiments.

Page 6, line 26. I suggest mentioning here that the historical simulations cover 1850-2014 CE, and not in line 31.

C2

Page 8, Section 3.4.2. Will the forcings for the past2K and past1000 experiments be identical for the period 850-1849 CE? I suggest clarifying this.

Page 8, Section 3.5. I suggest briefly explaining here or in the Table caption the meaning of the capitals N, M and L.

Page 9, Section 4.2. What is the difference in the GHG radiative forcing compared to PMIP3-CMIP5? Please explain.

Page 9, line, 8: 'Discrepancies in proxy-based temperature records'. Why are the temperature records mentioned here in the section on volcanic forcing? Please clarify.

Pages 10-11, Section 4.4. What is the difference in solar forcing compared to PMIP3? Please elaborate.

Page 11, line 26. Will ozone variations be provided by PMIP4 for the period 850-1849 CE? Please discuss.

Page 11, last line. Klein Goldewijk et al. 2016. The reference list only mentions Klein Goldewijk 2016, so without co-authors. Is the reference in the list incomplete?

Page 12. Section 4.5 discusses quite extensively the wood consumption. I wonder if this paper is the right place for this discussion, as it seems incompatible compared to level of detail in the rest of the manuscript. Wouldn't it fit better in a manuscript on LUMIP?

Interactive comment on Geosci. Model Dev. Discuss., doi:10.5194/gmd-2016-278, 2016.